

REMARKS

This amendment is responsive to the Office Action mailed March 27, 2006 in connection with the above-identified patent application. Detailed arguments in support of patentability of claims 1-38, 40-46 and 134-144 are presented, and re-examination is respectfully requested. New claims 134-144 have been added. Claim 39 has been cancelled. No new matter has been added.

Allowable Subject Matter

Claims 24-38 and 40 were objected to as being dependent upon a rejected base claim, but were deemed allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claims 24 and 40 have been placed into independent form. Claims 2-23 have been amended to depend from claim 24 and thus are also in condition for allowance. Claims 25-38 depend from claim 24 and thus are also in condition for allowance. New claim 144 has been added which depends from claim 24 and is in condition for allowance. Claims 41-46 have been amended to depend from claim 40 and are also in condition for allowance.

35 U.S.C. § 112 Rejections

Claim 1 was rejected under 35 U.S.C. 112, second paragraph, as being indefinite. Claim 1 recited "annular gas passage" and "dielectric barrier discharge plasma," which were considered indefinite. Claim 1, and claims 24 and 40, have been amended to recite a "passage" and "plasma" and are thus deemed to overcome this rejection. Forming a plasma by the use of a high frequency power source being applied to an electrode sleeve and contact tube is well known in the art, as discussed in the background section of applicant's specification.

Claims 4-6 were stated to recite the limitation "passage," and there was insufficient antecedent basis for this limitation in the claim. Claims 13-21 and 45 were deemed to recite the limitation "frequency" and there is insufficient antecedent basis for this limitation in the claim. The applicant has amended independent claims 1, 24 and 40 to recite a "passage" and a "power source which generates high frequency". Claims dependent from

claims 1, 24 and 40 recite a "passage" and were amended to recite "high frequency". Accordingly, each claim is considered to overcome this rejection.

Claim Objections

Claims 22, 40 and 46 were objected to because of the following informalities: the use of the word "class" in the claims. These claims were amended to call for a "group" and overcome this objection.

35 U.S.C. § 103(a) Rejections

Claims 1-3, 7-23, 39, 41 and 44-46 were rejected under 35 U.S.C. 103(a) as being unpatentable over Chiou et al. (U.S. Patent No. 6,700,093) in view of Penfold et al. (U.S. Patent No. 4,031,424). Claims 2, 3 and 7-23 were amended to depend from claim 24 and are in condition for allowance. Claim 39 has been cancelled. Claims 41 and 44-46 were amended to depend from claim 40 and are also in condition for allowance.

Chiou et al. was deemed to disclose a dielectric discharge apparatus for the removal of perfluorocompound, including a housing, a first and second dielectric tube and at least one electrode disposed in the housing. Cooling gas passages were deemed formed around the first dielectric tube and the housing and another around the second dielectric tube. Gases, which may be used, include carbon dioxide and nitrous oxide. The dielectric tubes can be ceramic (e.g., aluminum oxide).

The Examiner acknowledged that specific values for applied voltage are not taught by Chiou et al. The Examiner further acknowledged that Chiou et al. does not teach the use of a wire or gap dimensions.

Penfold et al. was deemed to disclose a discharge apparatus for cleaning and/or coating a wire which creates stable and uniform plasmas. A power supply was deemed used to form plasma. Plasma was deemed formed near a cylindrical cathode sheath and gases used are argon, neon and so forth. The apparatus was deemed to have a combined high voltage and field power supply. An annular chamber exists within a barrel. Gap sizes were deemed to be the diameter 1/10 to 6 inches (approximately 0.25 to 15 cm), and voltages range from a relatively low voltage to several thousand volts – i.e., about 500 to 3,000 volts. Exemplary substrates may be wire.

The Examiner concluded that it would have been obvious to use a wire substrate, and measure voltage and gap parameters, as taught by Penfold et al. in the Chiou et al. system.

Claim 1 is Not Rendered Obvious in View of Chiou et al., in View of Penfold et al.

In order to establish a prima facie case of obviousness, MPEP §2143 instructs that the following three basic criteria must be met,

First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).
(MPEP §2143, 8th edition, Rev. 3, pg. 135)

With respect to the first requirement involving the suggestion or motivation required to combine the references, MPEP §2143.01 further instructs that,

"There are three possible sources for a motivation to combine references: the nature of the problem to be solved, the teachings of the prior art, and the knowledge of persons of ordinary skill in the art." *In re Rouffet*, 149 F.3d 1350, 1357, 47 USPQ2d 1453, 1457-58 (Fed. Cir. 1998) (The combination of the references taught every element of the claimed invention, however without a motivation to combine, a rejection based on a prima facie case of obvious was held improper.).
(MPEP §2143.01, 8th edition, Rev. 3, pg. 135)

However, with respect to the first requirement, involving the suggestion or motivation required to combine the prior art, MPEP §2143.01 most notably instructs that,

...If [the] proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984)...

and in addition,

...If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims prima facie obvious. *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959)...

(MPEP §2143.01, 8th edition, Rev. 3, pg. 137-138).

It would not have been obvious to modify Chiou et al. to add a wire substrate and measure voltage and group parameters as taught in Penfold. It is only obvious in view of the applicant's disclosure. Thus, the Examiner is using impermissible hindsight.

Chiou uses the cold dielectric barrier discharge plasma to destroy and dissipate a perfluorocompound. The destruction and abatement of hazardous compounds is a primary use for dielectric barrier discharge plasma. In contrast, the present invention uses the cold plasma in a positive processing sense, that is, for cleaning welding wire, not for the purpose of destroying hazardous compounds. Chiou et al. does not teach or suggest the use of a dielectric barrier discharge plasma for cleaning wire. To create the dielectric barrier discharge plasma (DBD plasma) there is a need for a power source to create a high voltage in the range of 1.0-40 kV and a frequency preferably over 18 kHz. These parameters are simply not taught by Chiou et al. It is obvious to impart these parameters to Chiou et al. only in view of the applicant's disclosure.

The plasma in the chamber in applicant's disclosure cleans the metal wire, after which the plasma and wire both exit from the chamber into the atmosphere. In this manner, a cleaning gas introduced adjacent the conductive tip moves with the wire and constitutes the gas forming the plasma. The gas in the form of a cold plasma is exhausted from the chamber together with the wire moving through the chamber. The frequency of the power source is generally above 500 Hz and preferably above 18 kHz. Typically, the frequency is approximately 200 kHz. The applied voltage is 1,000 volts and is preferably greater than 2.0 kV. Typically, the voltage is approximately 8.0kV. The annular gap between the dielectric sleeve and the wire has a width of approximately 0.2-3.0 cm. A variety of power sources can be used to obtain the high voltage, high frequency signal necessary to create the dielectric barrier discharge plasma in the between the dielectric sleeve and the wire (see pages 4 and 5 of applicant's specification). None of these parameters are taught or suggested by Chiou et al. Chiou et al. teaches a different system and a different use of dielectric discharge and there is no motivation to use the system of Chiou et al. in the cleaning of wire. Thus, there is no motivation to combine Penfold et al. with Chiou et al.

Accordingly, claim 1 is considered to be in condition for allowance. New claims 132-143 have been added to depend from claim 1 and are also considered to be in condition

for allowance.

Claims 4-6, 42-43 are Not Obvious in View of Chiou et al. and Penfold et al. and Stava

Claims 4-6 and 42-43 were rejected under 35 U.S.C. 103(a) as being unpatentable over Chiou et al. and Penfold et al. and further in view of Stava (U.S. Patent No. 6,365,864). The Examiner acknowledged that Chiou et al. and Penfold et al. do not teach frequency values. Stava was considered to disclose a wire cleaning apparatus in which the wire is within a tunnel and tube assembly and a power supply generates a frequency of 1-3 kHz and 100 to 300 kHz. Plasma was deemed created within the tubing assembly and gas is also used. The Examiner's position is it would have been obvious to use a frequency of 1-3 or 100-300 kHz as taught by Stava in the Chiou et al. and Penfold et al. system.

Claims 4-6 and 42-43 are not considered obvious in view of Chiou et al. and Penfold et al. for the reasons discussed above for claim 1. Furthermore, claims 4-6 have been amended to depend from claim 24 and are considered to be in condition for allowance. Claims 42-43 have been amended to depend from claim 40 and are also considered to be in condition for allowance.

CONCLUSION

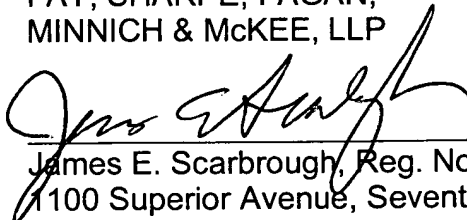
For the reasons detailed above, it is respectfully submitted all claims remaining in the application (Claims 1-38, 40-46 and 134-144) are now in condition for allowance.

Respectfully submitted,

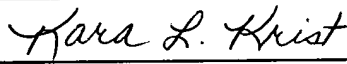
FAY, SHARPE, FAGAN,
MINNICH & McKEE, LLP

6/27/06

Date



James E. Scarbrough, Reg. No. 47,056
1100 Superior Avenue, Seventh Floor
Cleveland, OH 44114-2579
216-861-5582

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